

Preserving a Well-loved Heritage Structure

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Abstract

One of Metro Vancouver's oldest, most interesting and historic structures, the Westham Island Bridge is the single gateway onto Westham Island in Delta, BC, which is home to key agricultural developments, a sports club, and popular local tourist attractions. Now entering its 106th year, the Westham Island Bridge needs a comprehensive structural assessment and rehabilitation study that will consider extending the structure's life for another 20 to 25 years such that it can continue to provide safe and reliable access to the island. Mott MacDonald has been retained by the Owner to undertake this asset preservation work in three phases comprising a comprehensive structural assessment and rehabilitation plan, detailed design of the rehabilitation works and construction support. This paper describes the recent work undertaken in Phase 1 to formulate a cost effective rehabilitation strategy for the bridge.

Keywords: Condition assessment; live load evaluation; quantitative analysis; qualitative analysis; rehabilitation plan

1 Introduction

1.1 Project Background

Due to its age, the Westham Island Bridge has required near continuous monitoring and interventions to address ongoing deterioration. In recent years, the rate of deterioration of various elements has increased, resulting in more frequent repairs and interventions. In 2016, Mott MacDonald was retained by the Owner, South Coast British Columbia Transportation Authority (TransLink) to undertake Phase 1 of the Westham Island Bridge Rehabilitation Project, comprising a comprehensive Structural Assessment, a Live Load Evaluation and preparation of a Rehabilitation Plan for the Bridge. The work on this phase is being completed early in 2017 and is the subject matter of this paper.

The project includes additional phases for detailed design, procurement, and construction support

services, whose scope and timing are largely dependent on the outcome of Phase 1. Overall, the Project will help the Owner to manage the bridge more efficiently until replacement by reducing the need for frequent monitoring and interventions over its remaining service life.

1.2 Description of the Bridge

Westham Island Bridge, known as 0053 Canoe Pass in BC Ministry of Transportation and Infrastructure (Ministry) documentation, was constructed between 1909 and 1912. Most, if not all, of the structure's components have been replaced during its life to date. Except for alternating single lane traffic on the trusses and opening span, the bridge carries two lanes of traffic across Canoe Pass in the Fraser River Estuary from Delta on the mainland to Westham Island (*Figure 1*).

The posted vertical clearance is 4.38 m which requires traffic to be travelling within the centre 3 m of the available road width through the single